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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
AFREMOVA, VERA	

ART UNIT	PAPER NUMBER
1651	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/929,328	RASKIN ET AL.	
	Examiner	Art Unit	
	Vera Afremova	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

HC

DETAILED ACTION

Claims 1-4 and 6-26 (original and previously presented) are pending and under examination. Claim 5 was canceled by applicants.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 8, 9, 12, 23 and 26 remain rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al. {"Several biotic and abiotic elicitors act synergistically in the induction of phytoalexin accumulation in soybean". Plant Molecular Biology. 1986, 6: 23-32} as explained in the prior office action and repeated herein.

Claims are directed to a method for eliciting a compound having therapeutic activity from a plant or plant part wherein the method comprises the step of contacting a living, intact plant or plant part with an effective amount of acetic acid in order to induce production of a compound having therapeutic activity and recovering or collecting the compound. Some claims are further drawn to the use of acetic acid concentration of about 0.1 %. Some claims are further drawn to eliciting the therapeutic compounds having anti-microbial activity. Some claims are further drawn to the aqueous medium such as water or liquid medium.

Davis et al. teaches that acetic acid or acetate is an elicitor (see summary and Fig. 6). In particular, the references discloses a method for eliciting antimicrobial compounds phytoalexins from soybean plants wherein the method comprises the step of contacting living plants or

soybean cotyledons (embryonic first leaf upon germination) with an acetic acid buffer in amounts effective to induce production, to elicit and to recover the phytoalexins into the liquid aqueous medium comprising water. The effective amount as shown at the fig. 6 is about 0.1 %, for example: 0.08 % or 12 mM and more. Thus, the cited reference is considered to anticipate the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 7-21, 23, 25 and 26 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al. taken with Stevens et al. and US 3,810,990 as explained in the prior office action and repeated herein.

Claims 1-4, 8, 9, 12, 23 and 26 as explained above. Some claims are further drawn to eliciting and recovering therapeutic compounds from roots and/or from leaf cuticular waxes. Some claims are further drawn to the use of organic solvents including chloroform. Some claims are further drawn to assaying anti-microbial activity by determining microbial rates of growth and inhibition. Some claims are further drawn to the use of a large variety of plant species and to providing library of therapeutic compounds.

The cited reference by Davis is relied upon as explained above. It clearly teaches the use of acetic acid as plant elicitor.

In particular, the disclosure by Davis is related to one therapeutic compound and one plant. The reference does not clearly disclose extraction of therapeutic compounds from roots or from the leaf cuticular waxes.

However, the reference by Stevens teaches extraction of several therapeutically active flavonoid compounds including anti-microbial quercetin from various plant species wherein the cuticular material is wax and solvents comprise chloroform (abstract; table 1; page 805, col. 1, par. 3, lines 1-2). Thus, it is clearly teaches the concept of providing a chemical library of plant derived therapeutic compounds within the meaning of the claims. Further, the cited US 3,810,990 is relied upon to demonstrate the anti-microbial activity of the flavonoid compounds including quercetin that is taught in the reference by Stevens et al., for example.

In addition, the cited US 3,810,990 is also relied upon for the disclosure with regard to assaying the therapeutically active compounds/agents including flavonoids for antimicrobial activity by determining microbial rates of growth or inhibition by measuring microbial turbidity and/or counting of microbial colonies in the media/solutions with therapeutically active compounds (see example 7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to extract therapeutically active compounds from various plant parts including the leaf cuticular materials with a reasonable expectation of success in obtaining the compounds of interest including anti-microbial compounds and in providing library of plant derived therapeutic compounds because the prior art clearly demonstrates that the plant cuticular materials including waxes are known sources of biologically active compounds including anti-microbial compounds (Stevens). One of skill in the art would have been motivated to recover

various plant derived therapeutically active compounds by treating plants with elicitors including acetic acid as sole or as additional elicitor for the expected benefits in eliciting and in recovering larger amounts of compounds of interest from the experimental plants (Davis et al.). The methods for assaying anti-microbial activity of various compounds or agents which are presently claimed are very well known techniques in the field of microbiology as adequately demonstrated by the cited prior art (US 3,810,990). Although the particular experimental plant model in the cited references by Davis and Stevens are seedling leaves and grown leaves, the other living plant parts including roots are reasonably expected to be suitable living plant models for manifestation of eliciting effects within the meaning of the claims. Therefore, the claimed invention as a whole was clearly prima facie obvious, especially in the absence of evidence to the contrary.

With respect to claim 22 it is noted that although the instant claim does not appear to include soybean plant or *Glycine max* (particular plant species in the reference by Davis), the soybean plant treatment is encompassed by the instant invention (page 9, line 2; Fig. 1) and, thus, the use of the soybean plant is within the meaning of the extended plant listing of the claim 22 (see also specification page 71, third line from the bottom).

Therefore, the claimed subject matter fails to patentably distinguish over the state art as represented by the cited references. Thus, the claims are properly rejected under 35 USC 103.

Claims 1-4 and 6-26 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al. taken with Stevens et al. and US 3,810,990 as applied to claims 1-4, 7-21, 23, 25 and

26 above, and further in view of US 4,871,574 as explained in the prior office action and repeated herein.

Claims as explained above. Claims 6 and 24 are further drawn to the use of macerating step in the method for eliciting and recovering therapeutic compounds from plants.

The references Davis et al. taken with Stevens et al. and US 3,810,990 are relied upon as explained above. The cited references are silent about the step of macerating in the method for eliciting therapeutically active compounds.

US 4,871,574 (D) teaches the use of macerating step in the method for eliciting and recovering therapeutically active compounds from plant parts. In addition, it also teaches that acetic acid is used before or after or during macerating step (see Fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use a macerating step in a method for eliciting therapeutically active compounds from plant parts as taught or suggested by US 4,871,574 (D) with a reasonable expectation in success because maceration of plant parts/materials is a known technique in the collection/recovery of therapeutically active and therapeutically valuable plant derived compounds. Thus, the claimed invention as a whole was clearly prima facie obvious, especially in the absence of evidence to the contrary.

The claimed subject matter fails to patentably distinguish over the state art as represented be the cited references. Therefore, the claims are properly rejected under 35 USC 103.

Response to Arguments

Applicant's arguments filed 6/21/2004 have been fully considered but they are not persuasive.

A. With regard to the claim rejection under 35 U.S.C. 102(b) as being anticipated by Davis et al. Applicants appears to argue that the cited reference by Davis et al. teaches away by stating that "acetate is not acting as a general promotor of phytoalexin accumulation" and, thus, acetate is not a plant elicitor (response page 8, last par.). Upon review of the reference this interpretation is not found true because the reference clearly teaches that acetate is at the very least an indirect "elicitor" or promoter as being substrate for enzyme that control biosynthesis and accumulation phytoalexins (p. 30, left column, lines 8-16).

Applicants' argument that the Davis' reference teaches the use of "acetate" not "acetic acid" (response page 9, par. 1) is not particularly convincing with regard to the claimed invention because the claimed method is not limited by specific protocol of application and because the claimed method is open to incorporation of any and all inorganic compounds such as saline solutions that are commonly applied to the plans. Thus, the differences between starting forms of chemicals whether acids or salts are neither functionally nor materially different in the claimed method comprising step of contacting plant with acetic acid. There are no any differences particularly in view that the claimed method is not limited to volume/amounts of 0.1% acetic acid and to the plant amounts that are treated with 0.1 % acetic acid. Claims are not limited to any system of application (for example: volume of plant treatment vessel, amount of plants, amount of water) wherein 0.1% of acetic acid is applied to the plant to produce the eliciting effects as intended.

Applicants further argue that the Fig. 6 in the Davis' reference demonstrates a modest increase in phytoalexin accumulation and, thus, acetate cannot be "elicitor" (response page 9, par. 2). This argument is not convincing with regard to claim rejection under 35 U.S.C. 102(b) because claimed method requires only two active step of contacting plant with acetic acid and recovering compound of interest. These two steps are clearly disclosed by the cited reference. Applicants also argue that acetate might have a damaging effect (response page 10. par. 1). Yet, the mechanism of action or of induction of production of compound of interest by a plant is not the claimed subject matter. All the claimed invention requires is step of contacting plant with acetic acid and recovering compound of interest. The reference by Davis demonstrates some increase in recovery of phytoalexin after contacting plant with acetate. Thus, the amount have been "effective" within the scope of the instant claims. It is also noted that to the contrary to the applicants' argument about damaging effects the reference by Davis actually discusses damaging effect of organic acid including acetic acid on germination (page 28) rather than on recovery of compounds of interest.

The applicants' argument that Davis does not disclose the recovery of any elicited product (page 11, last par.) is not found convincing with respect to the differences as claimed and as disclosed by the cited art. The claimed invention does not indicate what is a recovery protocol and what compound is recovered after plant treatment with elicitor. Thus, the mere finding by Davis that larger amounts of phytoalexins are accumulated in the plant materials after elicitor treatment is a "recovery" of a "compound" within the meaning of the claims.

Applicants' argument that Davis does not disclose that sodium acetate and acetic acid can be quantitatively interconverted (response page 12, par. 2) has been fully considered again.

However, any quantitative evaluation cannot be applied to the differences as claimed and as disclosed by the art because the claimed invention does not indicate how much of 0.1% acetic acid is used, what are plant amounts that are treated with 0.1 % acetic acid and/or what is a system (for example: volume of plant treatment vessel, amount of plants, amount of water) wherein 0.1% of acetic acid is applied to the plant to produce the eliciting effects as intended.

Applicants also argue that Davis fails to disclose the claimed limitation that is "intact plant" by teaching the elicitor application to the wounded surface of plants (response page 11, par. 2) and to the soybean cotyledon. Yet, the claimed invention encompassed the use of "plant part" that is not the whole intact plant. The claimed "plant part" is used in alternative as encompassed by "or". The soybean cotyledons used in the reference by Davis are clearly plant parts, if not "intact".

B. With regard to the secondary references applicants argue that there no motivation to combine the references by Davis et al., by Stevens and others (response page 14) because Davis does not establish the eliciting effects of acetic acid and because Stevens teaches recovery of products from regular plant not from plant treated with elicitors. However, the reference by Davis demonstrates that acetate buffer has the elicitor activity when used alone or in the absence of other elicitor (table 1 and Fig. 6) and that the acetate buffer also acts as synergists when used with other established elicitors (table 1 and Fig. 6). Thus, the reference by Davis establishes that acetate is a plant elicitor. Applicants' argument as drawn to recovery of products is not particularly persuasive because claimed invention does not require any specific protocol of recovery including recovery from plants treated with elicitors as argued. The reference by Stevens teaches recovery of several therapeutically active flavonoid compounds that are anti-

microbials (as demonstrated by Jurd) from various plant species having cuticular material or wax and with solvents comprising chloroform as encompassed by the instant claims.

Moreover, motivation can come not only from direct teaching of the prior art, but also the nature of the problem to be solved and/or the knowledge of persons of ordinary skill in the art, Ruiz v. A.B. Chance Co. 357 F.3d 1270, 69 USPQ2d 1686 (2004). The cited references are in the same field of endeavour and seek to solve the same problems as the instant application and claims, and one of skill in the art is free to select components available in the prior art, *In re* Winslow, 151 USPQ 48 (CCPA, 1966). Further, the examiner recognizes that references cannot be arbitrarily combined that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references, *In re* Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. One test for combining references is what the combination of disclosures taken as a whole would suggest to one versed in the art, rather than by their specific disclosures, *In re* Bozek, 163 USPQ 545 (CCPA 1969). In this case, acetate is used for its known art specific property such as increase in production and recovery of compounds of interest as taught by Davis. The prior art also teaches various protocols of recovery and purification of compounds having therapeutic values as demonstrated by Stevens and US 4,871,574 (Yamazaki et al.) including recovery of antimicrobials from plants with cuticular material or wax (Stevens) as encompassed by the instant claims.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Afremova whose telephone number is (571) 272-0914. The examiner can normally be reached from Monday to Friday from 9.30 am to 6.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached at (571) 272-0926.

The fax phone number for the TC 1600 where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology center 1600, telephone number is (571) 272-1600.

Vera Afremova

AU 1651

April 1, 2005

VERA AFREMOVA

PRIMARY EXAMINER